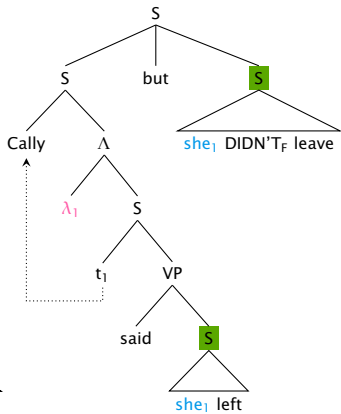
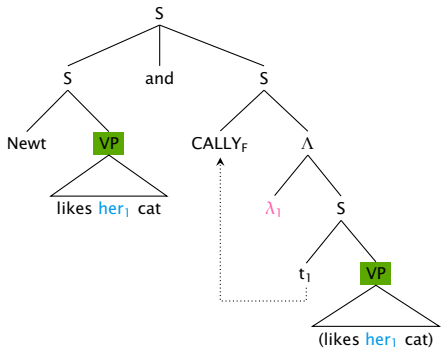


Givenness and local contexts

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the antinomy of the variable

Givenness is central to both. I'll make a few closely related claims about it today:

- Givenness is checked **compositionally**, via operators in syntax
- Givenness is **sensitive to the local context (assignment)**
- Constraints that inspect meaning must **leave bound variables *bound***

Take home: it's the *values* of variables that matter (not the little numbers).

- Dissolves puzzles as old as the ellipsis/focus literature
- Allows a simpler theory of ellipsis based on perfect identity
- Independent justification for various refinements of Givenness theory
- Sheds new light on impossible ACDs, focused bound pronouns

Givenness and anaphora

Damian blocked Steph, and then...

(1) SETH_F blocked Steph.

just right

(2) *STEPH_F blocked Damian.

underfocused

(3) *SETH_F blocked STEPH_F.

overfocused

Schwarzschild's (1999) account of these facts:

- **Givenness:** If B isn't F-marked, it must be Given \rightarrow
- B is **Given** iff it has an antecedent $A \cong B := [A] \in [B]_f$ \rightarrow
- **AvoidF:** F-mark as little as possible (w/o violating Givenness) \rightarrow

F-mark all, and only, material in B without a parallel in A .

$[B]_f$ is the focus set gotten by varying F-marked things in B (Rooth 1985, Kratzer 1991)

F-mark all, and only, the material in B that isn't parallel to A .

Damian blocked Steph \cong SETH_F blocked Steph

$\llbracket \text{Damian blocked Steph} \rrbracket \in \llbracket \text{SETH}_F \text{ blocked Steph} \rrbracket_F$

$\text{block}(\text{damian}, \text{steph}) \in \{\text{block}(x, \text{steph}) \mid x : e\} \quad \checkmark$

We need a definition of Given that's explicit about assignments:

$$A \cong B \iff \forall g : \llbracket A \rrbracket^g \in \llbracket B \rrbracket_f^g$$

For *any* way of understanding the free variables in A and B , \cong holds.

This \cong treats different indices as different, even if we don't.

That is a problem. Suppose we're in a context where $g(1) = g(2) = \text{mary}$.

(4) I saw her_1 and YOU_F saw $*HER_{F,2}$. but $her_2 \Rightarrow \neq$

(5) I saw Mary and YOU_F saw $*HER_{F,2}$. but $her_2 \Rightarrow \neq$

Our \cong *requires* the pronouns to be focused, despite their values in context!

- Forbid 'redundant' assignments (Schlenker 2005)? Names are variables?

Intuitively, meaning **in context** is what matters (Schwarzschild 1993, 1999):

$$A \cong B \text{ at } g \iff \llbracket A \rrbracket^g \in \llbracket B \rrbracket_f^g$$

This makes better predictions when $g(1) = g(2) = \text{mary}$.

(6) I saw her_1 and YOU_F saw $*HER_{F,2}$.

$her_2 \Rightarrow \cong$

(7) I saw $Mary$ and YOU_F saw $*HER_{F,2}$.

$her_2 \Rightarrow \cong$

$A \cong B$ is checked at the **contextual g** . But this can **unbind variables!**

Even if $g(1) = \text{mary}$, \cong in the red (though eventually not in the green).

(8) **Newt** likes her₁ cat. *CALLY_F [λ_1 t₁ likes her₁ cat] too.

(9) **Steph** hopes I cite him₁. *SETH_F [λ_1 t₁ hopes YOU_F cite him₁].

Unintuitive... but ok? No: in (10) Givenness is satisfied, period!

(10) Cally [λ_1 t₁ said she₁ left] but *she₁ DIDN'T_F leave.

Empirics aside, this is *weird*. Bound variables *have values in their local contexts* (though from the 'outside' the idea that they have values may seem strange, cf. Fine 2003, 2007). Givenness as currently stated **discards** those values.

Consider: presupposition satisfaction is checked in a local context:

(11) If there's an escalator in 18SEM, **the escalator in 18SEM is hidden**.

(12) Each of these students_{*i*} brought **their_{*i*} laptop**.

If the congruence constraint was a kind of presupposition (as has often been proposed), it would be surprising if it was not also checked 'in situ'.

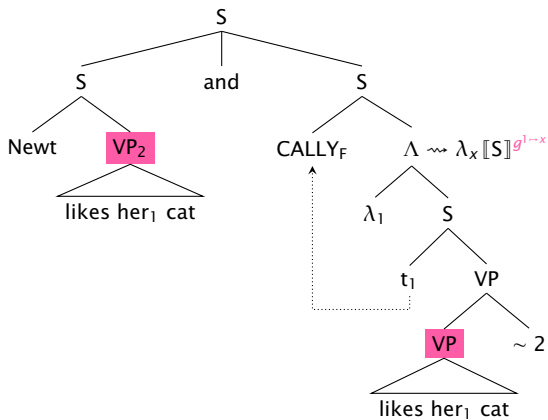
There is an alternative. Rooth's (1992a) \sim works in situ, requiring its associate B to be congruent with the value of a variable n :

$$\llbracket B \sim n \rrbracket^g := \begin{cases} \llbracket B \rrbracket^g & \text{if } g(n) \in \llbracket B \rrbracket_f^g \\ \text{undefined} & \text{otherwise} \end{cases}$$

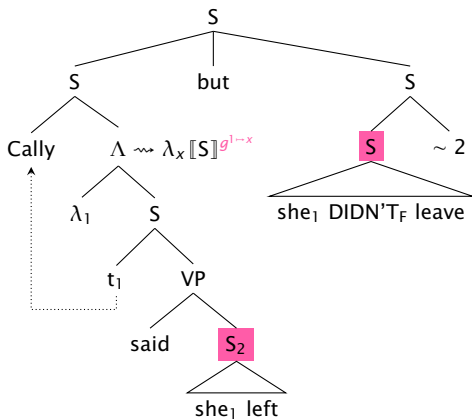
B and the $\llbracket A \rrbracket$ stored at n may be eval'd at **different assignments**.

Rooth doesn't treat \sim as a Givenness operator. But it can be repurposed as one.

I'm adopting a semantic theory of alternatives for concreteness, but these points apply equally to syntactic theories of alternatives (Katzir 2007, Fox & Katzir 2011).



$\llbracket \text{likes her}_1 \text{ cat} \rrbracket^{1 \mapsto \text{mary}} \notin \llbracket \text{likes her}_1 \text{ cat} \rrbracket_f^{1 \mapsto \text{cally}} \#$



$\llbracket \text{she}_1 \text{ left} \rrbracket^{1 \mapsto \text{cally}} \notin \llbracket \text{she}_1 \text{ DIDN'T}_F \text{ leave} \rrbracket_f^{1 \mapsto \text{mary}} \quad \#$

We update Schwarzschild (1999) so that Givenness is checked in situ:

- **Givenness:** If B isn't F-marked, it must be Given \rightarrow
- B is **Given** iff it **is the sister of** \sim \rightarrow
- **AvoidF:** F-mark as little as possible (w/o violating Givenness) \rightarrow

We stand in need of one more revision:

(13) Steph [λ_1 t_1 liked his_1 shot] and $SETH_F$ [λ_2 t_2 liked his_2 shot].

While the green is \cong , the red isn't! (Like 'rebinding' sloppiness. Ask me about this!)

$$\llbracket his_1 \text{ shot} \rrbracket^{1 \mapsto \text{steph}} \notin \llbracket his_2 \text{ shot} \rrbracket_F^{2 \mapsto \text{seth}} \quad \#$$

This points to the following revision, weakening Givenness:

- **Givenness:** If B isn't F-marked, it must be **dominated by** a Given node. \rightarrow

This is a new argument for something similar to "Maximize Background". Pressure for \sim to attach to largest possible constituents.

Akan data due to Augustina Owusu (p.c.):

- (14) Kofi re-pa Kwame ho.
Kofi PROG-pass Kwame body
'Kofi is overtaking Kwame'

Deebi! KWAME na ε-re-pa KOFI ho no.
No! Kwame FOC 3SG-PROG-pass Kofi body DEF
'No, KWAME is overtaking KOFI.'

No, though usually treated as DEF marker (cf. Renans 2018), may mark Givenness.

The basic patterns are reproduced with indexical expressions:

(15) (I'm the best.) No, I_F am! / Yes, you are.

But there is a striking disanalogy in *index-dependency*.

(16) In '92 the president invaded Iraq. *In '04 [the PRESIDENT]_F invaded Iraq.

(17) In '92 HW invaded Iraq. In '04 W_F invaded Iraq.

Givenness relates *meanings* via \sim . We've seen ample evidence that the meanings of pronouns (indexicals) saturate the assignment (context).

Data like (16) suggest meaning doesn't saturate the index (Lewis 1980):

$$\llbracket B \rrbracket^{c,g} = \lambda_{w,t} \dots, \text{ not } \llbracket B \rrbracket^{c,g,w,t} = \dots$$

A better theory of ellipsis

Ellipsis requires identity.

(18) I saw an elk from France. Did YOU_F (see an elk from France)?

(19) I saw her, but YOU_F DIDN'T_F (see her).

Sloppy readings are easy to accommodate:

(20) Mary [$\lambda_i t_i$ likes her_{*i*} office], but SUE_F DOESN'T_F ($\lambda_j t_j$ like her_{*j*} office).

Sag characterized *A* and *E* here as 'alphabetic variants', a relation inspired by the λ -calculus notion of α -equivalence (though crucially distinct. . . stay tuned).

Sloppy pronouns don't need to be bound inside E ('**rebinding**'):

(21) John_{*i*}'s mom likes him_{*i*}. BILL_{F,*j*}'s mom DOESN'T_F (like him_{*j*}).

(22) Bagels_{*i*} [I like t_{*i*}]. DONUTS_{F,*j*} [I DON'T_F (like t_{*j*})].

(23) Every dog_{*i*} thinks I like it_{*i*}. Every CAT_{F,*j*} thinks I DON'T_F (like it_{*j*}).

(24) If I see a cat_{*i*} I pet it_{*i*}. If I see a DOG_{F,*j*} I DON'T_F (pet it_{*j*}).

Same range of interpretations available under deaccenting. Givenness is implicated.

See Evans 1988, Jacobson 1992, Rooth 1992b, Hardt 1993, Fiengo & May 1994, Tomioka 1999, Takahashi & Fox 2005, and many others.

Two-part theory of ellipsis licensing

(Rooth 1992b)

Ellipsis is licensed whenever the following two conditions are satisfied:

- Syntactic: $A \approx E$ Syntactic identity **up to variable names**[?]
- Semantic: $\Gamma[A] \cong \Delta[E]$ A and E are (in) **congruent** structures

Note that \cong is the **ex situ** congruence relation.

$$\text{John } [\lambda_1 t_1 \text{'s mom likes him}_1] \cong \text{BILL}_F [\lambda_2 t_2 \text{'s mom does (like him}_2)]$$

$$\text{likes}(\text{mom}(\textcolor{violet}{j}), \textcolor{violet}{j}) \in \{\text{likes}(\text{mom}(\textcolor{violet}{x}), \textcolor{violet}{x}) \mid x : e\}$$

Binding in the elliptical clause guarantees that congruence is satisfied.

In general, the interaction of binding and alternatives creates complications (Poesio 1996, Shan 2004, Romero & Novel 2013, Charlow 2019b). This won't affect any of my points.

Hard to oversell how successful, illuminating this approach has been.

- Congruence is a feature of grammar not specific to ellipsis (Schwarzschild 1999, Büring 2016, cf. Tancredi 1992, Fox 1999).

The syntactic condition is unfortunate (Merchant 2001), in tension with other data.

Something akin to congruence is present even in dissenters from the overall Roothian picture (e.g., Merchant 2001, Kehler 2000, building on Hobbs 1979).

Why not just coindex the sloppy pronoun and its correlate in A?

$$\begin{aligned} \text{Mary}_1 [\text{t}_1 \text{ likes her}_1 \text{ office}] &\cong \text{SUE}_{F,1} [\text{t}_1 \text{ does (like her}_1 \text{ office)}] \\ \text{likes(m, office(m))} &\in \{\text{likes(x, office(x))} \mid x : e\} \end{aligned}$$

Actually, this needs to be *ruled out*:

- (25) Newt likes her₁ cat and *CALLY_F [λ_1 t₁ does (like her₁ cat)] too.
- (26) Steph hopes I cite him₁ and *SETH_F [λ_1 t₁ hopes YOU_F (cite him₁)].
- (27) Cally [λ_1 t₁ said she₁ left] but *she₁ DIDN'T_F (leave).

No Meaningless Coindexing (NMC)

(Heim 1997: 202)

If an LF contains an occurrence of a variable v that is bound by a node α , then all occurrences of v in this LF must be bound by the same node α .

- Sag defined a sense of ‘ α -variance’ distinct from λ -calculus, to similar effect.
- Like bans on redundancy, trying to get variables to be less variable-like.

But while NMC guarantees that all occurrences of an index map to the same referent, it doesn’t guarantee that all instances of a referent come from the same index.

(28) Either Cally [$\lambda_1 t_1$ **hates her₁ cat**] or *Cally [$\lambda_2 t_2$ **LOVES_F HER_{F,2} cat**].

Seems we want a **one-to-one** association between indices and referents. But that’s just a way of saying that it’s the referents that really matter, in the end.

Sag 1976, Tomioka 1995, Romero 1998, Sauerland 1998, 2004, Kennedy 2004, 2014, Takahashi & Fox 2005, Takahashi 2006, Hartman 2011, Roelofsen 2011, Crnić 2017.

The difficulties here are entirely due to using an **ex situ** \cong .

They vanish with an in situ congruence mechanism, e.g., \sim . The LFs generating impossible readings cannot satisfy \sim . There is no need for NMC.

(29) Newt likes her₁ cat and CALLY_F [λ_1 t₁ does #(like her₁ cat)] too.

(30) Al hopes I cite him₁ and BO_F [λ_1 t₁ #hopes YOU_F (cite him₁)].

(31) Cally [λ_1 t₁ said she₁ left] but #she₁ DIDN'T_F (leave).

Getting rid of NMC means we can require exact identity in ellipsis,

(32) John_i's mom likes him_i. BILL_{F,i}'s mom DOESN'T_F (like him_i).

Why might we want this? Ellipsis *sites* exhibit variable-like behavior.

(33) When John has to cook, he doesn't want to (cook).

When he has to CLEAN, he doesn't (want to clean) either.

(34) John bought the books he was supposed to (buy _).

But he READ the books he WASN'T (supposed to read _).

Strongly suggests that an anaphora-like process undergirds ellipsis resolution But anaphora is a relation based on *exact identity* (of meaning).

The dynamics of ~

What does it mean for A_n , the antecedent of $B \sim n$, to bear an index?

- Could mean A_n binds $B \sim n$
- Could mean the two are merely coreferential

Treating B's Givenness in situ via \sim speaks in favor of **binding**.

Intuitively the second conjunct counts as Given in light of the first:

(35) Every boy₁ said [Seth likes him₁]₂ and [STEPH_f likes him₁] ~ 2.

Yet this is impossible if ~ and its ‘antecedent’ are merely coreferential. That requires there to be a contextual value for 2 such that, for any boy x :

$$g(2) \in \{\text{like}(y, x) \mid y : e\}$$

The focus set varies with x ! No single value for $g(2)$ can do all this work. [At best, $g(2)$ will be ‘about’ one of the relevant boys.]

If *Seth likes him₁* **binds** ~ 2 , the value of 2 shifts boy-by-boy:

every boy $[\lambda_1 \dots [\text{Seth likes him}_1] [\lambda_2 \text{ t}_2 \text{ and } [\text{STEPH}_f \text{ likes him}_1] \sim 2]]$

a	likes(seth, a)
---	----------------

$$g(2) \in \{\text{likes}(x, a) \mid x : e\} \quad \checkmark$$

b	likes(seth, b)
---	----------------

$$g(2) \in \{\text{likes}(x, b) \mid x : e\} \quad \checkmark$$

c	likes(seth, c)
---	----------------

$$g(2) \in \{\text{likes}(x, c) \mid x : e\} \quad \checkmark$$

Givenness/ \sim are often said to be *anaphoric* (Rooth 1992a, 2016, Schwarzschild 1999). Treating \sim in situ forces us to take this seriously.

The occurrences of \sim in (36) and (37) are *donkey pro-forms*.

(36) If [a cat₆ [Mary likes t₆]₅] you can bet that [SUE_F LOVES_F it₆] \sim 5

(37) If [[the copier or the fax]₇ [you use t₇]₈] [I_F CAN'T_F (use it₇)] \sim 8

So \sim participates in the same binding configs as pronouns (cf. Partee 1973).

Some extensions (time permitting)

On the other hand, whereas binding seems sensitive to linearity (roughly), it's well known that \sim satisfaction can be cataphoric (Rooth 1992a):

(38) An AMERICAN_F farmer was talking to a CANADIAN_F farmer.

Brasoveanu & Szabolcsi (2013) argue that this shows \sim imposes itself *after* the sentence has been composed — i.e., is 'post-suppositional'.

(39) A-mo hashitta. 'A ran away too'

(40) A-mo B-mo hashitta. 'A and B ran away'

To get a flavor for post-suppositions, let's consider a paradigm use-case: marking dependent interpretations (Henderson 2014, Kuhn 2017, Law 2018).

(41) Every boy saw a movie. Some even enjoyed it.

(42) Every boy saw a-RED movie. (Requires multiple movies seen.)

The context reflects the dependency between boys and movies seen:

b_1	m_1
b_2	m_2
b_3	m_3

This dependency can be anaphorically retrieved as in (41), or required to store multiple movies *post-suppositionally*, as in (42).

(43) I saw t_i [the man YOU_F did (see t_j)] $_i$.

(44) I saw t_i [a book about the man YOU_F did (*see t_j)] $_i$.

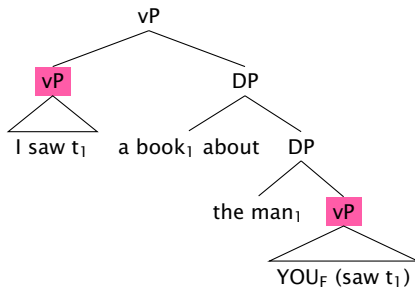
Heim (1997) proposes to explain the data as a failure of \cong .

(45) [I saw t_i]_n [the man_i [YOU_F did (see t_i)] $\sim n$].

(46) [I saw t_i]_n [a book_i about the man_j [YOU_F did (*see t_j)] $\sim n$].

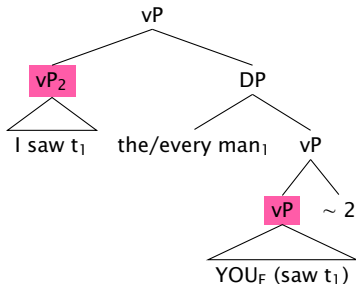
I saw $t_i \not\cong$ YOU_F saw t_j , whence the ungrammaticality of (46).

Ex situ \cong relies on variable names, and thus on NMC (to avoid spurious \cong).



There is no way for \sim to relate the vPs, even with coindexing: the first trace evaluates to a book; the second trace evaluates to a man.

But how is \sim satisfied in the *good* cases? A configuration like the one below looks good at first, but remember that ~ 2 needs be bound!



The DP necessarily binds into vP_2 . How can vP_2 bind ~ 2 ?

Recall from earlier that \sim satisfaction can be symmetric. As Brasoveanu & Szabolcsi argue, this suggests that \sim satisfaction is post-suppositional.

(47) An AMERICAN_F farmer was talking to a CANADIAN_F farmer.

(48) A-mo B-mo hashitta. 'A and B ran away'

Notably anticipatory stress is common (obligatory?) in ACD:

(49) I_F read everything YOU_F did.

$\underbrace{[\text{John read } t_1]}_2 \quad \underbrace{[\text{everything}^1 \text{ MARY}_F \text{ did (read } t_1)]}_{2 \sim 3}$

a	read(j, a)	{read(x, a) x : e}	✓
b	read(j, b)	{read(x, b) x : e}	✓
c	read(j, c)	{read(x, c) x : e}	✓

Should \sim require satisfaction in every row (assignment), or would something weaker be appropriate?
 The weaker notion could be consistent with the head-identity effects noted by Sauerland (1998, 2004).

- (50) Every third grade boy likes his mom.
And every FOURTH_F grade boy likes his mom.
- (51) Every third grade boy likes his mom.
And every FOURTH_F grade boy likes HIS_F mom.

What is the focused bound pronoun contrasting with?

In light of the non-focused variant, why isn't this overfocusing?

$\overbrace{\text{Every TGB}^1 [t_1 \text{ likes his}_1 \text{ mom}]}^5$.
 $\overbrace{\text{Every FGB}_F^3 [t_3 \text{ likes HIS}_{F,3} \text{ mom}]}^{5 \sim 6}$.

$\underbrace{\hspace{10em}}_2$
 $\underbrace{\hspace{10em}}_{2 \sim 4}$

a	moma	d	{mom d, mom a, ...}	✓
b	mom b	e	{mom e, mom b, ...}	✓
c	mom c	f	{mom f, mom c, ...}	✓
...

$\underbrace{\text{Every TGB}^1 [t_1 \text{ likes his}_1 \text{ mom}]}_2$.
 $\underbrace{\text{Every FGB}_F^3 [t_3 \text{ likes his}_3 \text{ mom}]}_{2 \sim 4}$.

Wrapping up

Congruence is a compositional, anaphoric, dynamic process.

Indices matter a lot less for ellipsis and deaccenting than thought. They help determine values for variables. But it's the *values* that are important.

Facilitates big simplifications in grammar (e.g., no NMC), exact-identity-oriented theories of ellipsis (at last!), and offers a fresh perspective on some old facts.

I suggested that values not indices are what really matter for reduction licensing.

This is similar in many respects to considerations in Heim (2009), though Heim's concern is Binding Theory, and Heim develops an architecture in which values in global (cf. local) contexts are given primacy.

Next step: seeing how far we can push this.

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